

REMARKS/ARGUMENTS

As discussed during the personal interview with examiners Jeffrey Sharp and Flemming Saether on June 13, 2005, the undersigned is unable to consult with the applicant within the time remaining for responding to the Office Action, and this consultation is necessary prior to amending the claims beyond the amendments made herein. Accordingly, a supplemental amendment may be necessary after the consultation with applicant. Any supplemental amendment will be submitted as soon as possible so that the examiner can consider this amendment and the supplemental amendment together, without necessitating piecemeal prosecution.

Favorable reconsideration of this application is respectfully requested in view of the foregoing amendments and the following remarks. Petition and fee for a three (3) month extension of time are attached hereto, extending the time for response to and including June 13, 2005. A separate letter to the Drawing Review Branch is also attached, with three replacement sheets of drawings containing amendments to remove duplicate reference characters or add missing reference characters. No new matter has been introduced.

The objection to the previously amended specification, claims and drawings on the grounds that new matter was introduced by limiting the pitch of the external thread on the puller bar to 3.005mm, and the pitch of the internal thread in the studbolt to 3.00mm is in error. Support for these dimensions is found in the originally filed specification at page 13, lines 10 and 11.

The application and the art of record have been carefully reviewed, and the specification and drawings have been amended to correct informalities noted therein. The claims have been amended to more clearly patentably distinguish over the art of record.

The present invention comprises a unique hydraulic tensioner for pre-tensioning studbolts as used in turbine casings, for example. Tensioners are known in the art for this purpose, as demonstrated by the art of record, but the tensioner of the invention has a novel cone nut assembly, split washer, and thread form not disclosed in the art of record.

The unique design and function of the cone nut assembly, when combined with the hydraulic bolt tensioner, locates the bolt tensioner wholly within the dimensions of the spotface provided on the turbine casings. The cone nut is constructed in a manner to enable transmission of residual bolt force occasioned by the tensioning across the entire thread profile. It does so by permitting the thinner lower sections to progressively expand under the influence of the radial force vector developed by the thread interface, thus allowing stresses to be dissipated and evenly loading the interface.

Further, the bridge used in the tensioner of the invention stands directly upon the outer sleeve that forms a component of the cone nut assembly, and applies force to the joint face through the component, allowing for an even spread of compressive load across the spotface. No other tensioner system does this.

Also, a unique split washer design is provided for use with the tensioner of the invention. The split washer of the invention has releasable means that function to hold the washer in an adjusted position until it is desired to release load on the studbolt. The releasable means is then disengaged, whereby the split washer halves can be readily released to relieve pressure on the connection.

Claim 1 and the claims dependent therefrom are directed to a tensioner having the cone nut assembly.

Claim 9 and the claims dependent therefrom are directed to the unique threadform for use in the hydraulic tensioner of the invention. In particular, the threadform comprises an internally threaded bore in an end of the studbolt and a complementary externally threaded end on the puller bar, said internally threaded bore and said externally threaded end being tapered at an angle of about 10° , with the thread flank that faces away from the article being substantially perpendicular to the axis of the studbolt.

Claim 16 and the claims dependent therefrom are directed to a tensioner having a puller buddy for cooperation with the puller bar, wherein the externally threaded end of the puller bar has a 10° taper, and an hydraulic means acts between the puller bar and the article via a bridge

positioned around and over the nut and against the puller bar to pull the puller bar and puller buddy in a direction away from the article to tension the studbolt.

Claim 17 and the claims dependent therefrom are directed the cone nut assembly for use with the hydraulic tensioner, including the nut body with a conical outer surface and the annular collar with a complementary cone shaped recess, wherein the nut body is screwed onto the studbolt and into the recess of the annular collar, and is adapted to be adjusted along said studbolt and against said collar to take up elongation of the studbolt as a result of applying tension to it.

None of the art of record, whether considered singly or in combination, discloses or suggests a unique hydraulic tensioner and the components thereof as claimed herein.

Claims 1, 2 and 17 as previously amended were rejected on the grounds that it would be obvious to modify Heinhold (5878490) in view of Simms (EP-0797012) and Pappas (3424080). Heinhold was said to disclose a nut body 20 having a tapered portion 36, and an annular collar having a complementary tapered recess, but that the direction of taper was opposite that claimed. Pappas was relied upon for its alleged teaching of orienting the taper in the opposite direction. It is submitted that this modification of Heinhold would not produce the claimed invention. The tapered surfaces referred to in Heinhold are provided on a sleeve 36 that is engaged around a nut 26', and the sleeve is used to rotate the nut by engaging a tool 40 in openings 38 provided in the sides of the sleeve. The upper end of the sleeve is tapered to provide clearance with a similarly tapered surface on a bridge 28'. This structure, and the attendant function, are not the same as or equivalent to the structure and function of the cone nut assembly of the present invention. Reversal of the direction of taper in the referenced parts of Heinhold would not produce the claimed invention.

Further, the tapered surfaces in Pappas are for an entirely different purpose and actually comprise opposing parts of the expandable chamber. They would not provide any motivation or teaching for changing the angle of taper in Heinhold.

None of the other references of record teach or suggest a cone nut assembly as now claimed.

Application No. 10/699,948
Amendment dated June 13, 2005
Responds to Office Action of December 13, 2004

Similarly, neither the particular threadform nor the split washer with releasable means are disclosed or suggested in the art of record. Admittedly, the prior art does show tapered threads, and tapered buttress threads, and it also shows split washers. However, none of the art suggests the particular configuration of the threads, or the split washer with releasable means as now claimed.

It is believed that the claims as now amended patentably and allowably distinguish over the art of record, and a favorable action is requested.

Respectfully submitted,

Dennis H. Lambert & Associates

A handwritten signature in black ink, appearing to read "Dennis H. Lambert", written over a horizontal line.

Dennis H. Lambert
Reg. No. 25,017

DHL:cal

Dennis H. Lambert & Associates
7000 View Park Drive
Burke, Virginia 22015
Tel: 703-451-1227
Fax: 703-451-1297